

certainly do not convey any very definite ideas to the uninitiated. We will, therefore, endeavour to explain in a few words what "Jacamars" and "Puff-birds" are.

The Jacamars or family "Galbulidæ" of naturalists form a small group of birds somewhat resembling the kingfishers in general external structure, but with zygodactyle feet, *i.e.* the toes placed two before and two behind, and with brilliant metallic plumage. They inhabit the forests of America from Guatemala to Southern Brazil, and are generally met with perched upon the outer branches of the trees, and capturing their insect-prey by short flights, after which they return to their former station—like our common flycatcher. The known Jacamars are nineteen in number, referable to six genera. Of all of these species and, in most cases, of both sexes of them, full life-sized figures are given in the present work, from the artistic pencil of M. Keulemans. Of the accompanying letterpress it need only be said that it embraces an account of all the particulars yet known respecting these birds, which at the present time in several cases amounts to very little, and in nearly every instance leaves much to be done before we can be said to have anything like a perfect knowledge of them.

Of the closely allied family of the Bucconidæ or Puff-birds nearly the same may be alleged as regards our knowledge of their life-history. The dense wilds of South America need many further years of constant exploration and minute investigation before such particulars can be duly recorded. The Puff-birds are a more numerous group than the Jacamars. Mr. Sclater recognises forty-four species of the family Bucconidæ, divisible into seven genera. These are treated in exactly the same way as the Jacamars, and illustrated in a similarly artistic manner. No one we think will be likely to find fault with the life-like way in which the artist has represented the various species. Even as a picture-book the Jacamars and Puff-birds form a most attractive volume.

The work now completed is uniform in size and style with Mr. Sharpe's "Kingfishers," Messrs. Marshalls' "Barbets," and Capt. Shelley's "Sun-birds," and forms one of the same series of illustrated Ornithological Monographs prepared by different Members of the British Ornithologists' Union. Nor is the series likely to end here, for we are informed that Mr. Dresser has a companion volume on the "Bee-eaters" in a very forward state, and that other similar works are already projected.

#### OUR BOOK SHELF

*An Illustrated Essay on the Noctuidæ of North America, with "a Colony of Butterflies."* By Augustus Radcliffe Grote, A.M., &c. 8vo. (London: Van Voorst, 1882.)

THE main feature in this beautifully-got-up little book consists in the four coloured plates, which depict forty-five of some of the most charming insects of the family of moths, to which the author has devoted his special attention. The species have all been previously described, but all those who have studied *Lepidoptera* know that it is often practically impossible to identify these insects from descriptions only, and will feel grateful to Mr. Grote for the help afforded by these plates, which are very beautiful. They will likewise thank him for identifying many of the North American species "described" by Walker, according to the types in the British Museum. This process of identifying Walker's types appears likely to occupy the attention of entomologists at least to the

end of the present century. The long introductory "Preface" (which forms more than a third of the entire text, and is paged continuously with it) is open to the suggestion of being too rambling in character, and of containing general matter, and polemics, foreign to the title of the book. The chapter on structure and literature will prove very useful. Here, as in the "Preface," a want of concentration in the remarks is observable. The supplementary "Colony of Butterflies" is the most successful part of the work from a literary (and perhaps also from a scientific) point of view. A curious butterfly of a genus of boreal proclivities (*Eneis semidea*) inhabits the summit of Mount Washington (in the White Mountains), above an elevation of 5600 feet to the summit (6293 feet), and is there isolated. Naturally this is associated with the glacial theory (and it might find many parallels in the Alps of Europe, &c.), and the author has contrived to give us a very instructive chapter on this subject, but we do not gather how he came to know that the "colony" first settled "about one hundred thousand years ago."

*Six Months in Persia.* By Edward Stack. 2 vols. (London: Sampson Low and Co., 1882.)

NOTWITHSTANDING some serious drawbacks, this work will be accepted as a useful contribution to our knowledge of a country about which much ignorance still prevails. It embodies the results of a journey made through the central provinces of Persia last year by a promising member of the Bengal Civil Service *en route* for England. By departing, wherever possible, from the beaten tracks along the main highways between the Persian Gulf and the Caspian, the traveller has succeeded in collecting much useful information regarding many districts about which very little was hitherto known. But the journey having been specially undertaken at some personal inconvenience in the interests of geographical research, it seems all the more surprising that more forethought was not shown by the explorer in qualifying himself for the task. A little time devoted to a study of the broad principles of geology and botany, as well as to the simple methods of taking altitudes, would have enabled him to turn his opportunities to far better account. As it is, these branches of science are almost entirely neglected, and the space which might have been usefully occupied, with such subjects, is too often sacrificed to trivial details irritating to the reader, and swelling the work to undue proportions. As Damāvand was ascended, it would have been more satisfactory, for instance, to have checked the altitude of that famous cone (18,600 feet), taken some years ago by the Russian Caspian Survey, than to be told that at one place there were two little shrines "with small blue domes, date groves and water," at another a ruined mud fort, further on many other ruined mud forts, that one man asked him "endless questions about England which I answered to the best of my ability for the space of two hours," that another "gave me a good dinner," and so on for page after page. Nevertheless some important work, chiefly of a topographical character, was carried out and carefully recorded in the region between Shiraz and Lar, in the Saidábád and Karmán districts, in the neighbourhood of Yazd, and especially in the Bakhtari highlands west of Isfahán. Here the orography and hydrography of the Chahar Mahal and Zarda-kuh uplands were carefully surveyed, and a fresh route explored thence northwards to Gilpaigan. As, according to the latest accounts, the Bakhtari hillmen are again threatening to give trouble to the Prince-Governor of Isfahán, this information may soon prove valuable. These fierce nomads are of the same race and speech as the Kurds, who committed such havoc in the Urmia district last year, and who seem to be again preparing for fresh raids on the Turco-Persian frontier between Azerbaijan and Armenia.

In every respect the most interesting and valuable part of the work are the concluding chapters of vol. ii., in which all the fresh geographical materials are conveniently summed up, the land revenue system of Persia dealt with probably for the first time in a really satisfactory manner, and the present condition of the country made the subject of some opportune remarks. It is pleasant to learn that this venerable monarchy, so far from being "played out," is even beginning to show signs of renewed vitality. The famine-stricken districts are gradually recovering, the peculiar underground system of irrigation is being largely extended, brigandage has been almost everywhere suppressed, the governors are beginning to show some regard for the interests of the people, while many will perhaps be surprised to hear that the people themselves are, on the whole, more comfortable, better clad, and better fed than the Indian rayats. There is, of course, "much to be done in the way of governing and reducing things to order;" but notwithstanding much maladministration and many local grievances, "the progress made by Persia within the last ten years is unmistakable."

The work is supplied with a series of excellent sectional maps of the regions traversed by the explorer. But there is neither index nor a table of contents beyond the briefest chapter-headings. The stages, however, along the routes are in all cases carefully recorded, with their distances and time occupied in covering the ground.

A. H. KEANE

*Notes on Chemical Calculations, with Examples, for use in the Leys School.* By A. Vinter, M.A. (Batley: J. S. Newsome, 1882.)

THE selection of calculations contained in this little book, while exhibiting nothing new, is satisfactory; the notes, in so far as they are explanatory of the calculations, are clear, and to the point, but when they deal with such subjects as atoms, molecular weights, and equivalency, they become sadly confused; on these points they must, we are afraid, be very misleading to the boys who make use of this book in the Leys school.

*A Pocket Guide to British Ferns.* By Marian S. Ridley. (London: Bogue, 1881.)

MISS RIDLEY'S book merits its title; for it is of a most convenient size for the pocket. Whether a new book on British ferns was needed may fairly be doubted; but this little volume will be useful to many beginners. The characters of each fern are given in tabular form, each occupying a page; and the principal points of distinction are clearly brought out.

## LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

### A Meteorological Spectroscope

As a considerable amount of interest seems to have been awakened lately in meteorological spectroscopy, it may be of service to observers to call their attention to a form of pocket spectroscope specially adapted for this purpose which Mr. Adam Hilger, of 192, Tottenham Court Road, prepared for me some months ago. The compound triple prism of flint glass is mounted as nearly as possible at the minimum angle of deviation for "C." We thus obtain a much better view of the red end of the spectrum than with the ordinary pocket-spectroscope. Mr. Hilger has also managed to secure an increased dispersion, which, with very perfect definition, enables me to see the lines in the so-called "rain-band" at "D" with great ease.

Besides the ordinary achromatic object-glass between the

adjustable slit and the prisms, the spectroscope is fitted with a telescope, *i.e.* a sliding tube carrying a lens, or second object-glass, in front of the slit—proposed by Mr. Lockyer—to bring the light from external objects to a focus on it. By this means one is able to differentiate, or localise, the spectra of different parts of the sky. I feel sure that the use of the telescope would prevent people falling into some of the mistakes one sees in publications about rain-band spectroscopy.

September 14

J. F. D. DONNELLY

### The New Comet

ON Sunday morning, the 17th inst., at 10.45 a.m., I found a bright comet near the sun. The nucleus was bright, stellar in appearance; the tail was about 4' long, and brightest at the outside edges, giving a double appearance. The direction of the comet was to the centre of the sun. The comet preceded the sun's centre at 10.59 by 6m. 50s., at 12h. 0m. by 5m. 44s. The distance from the sun's limb on the parallel was at 11h. 10m. 18" (of arc), and at 12h. 6m., 13' 4".

I hoped to get more and better measures, but the sky overcast, and with the exception of a short time on Monday morning, when I looked but did not see, the comet has remained so.

I used a helioscope of six inches' aperture.

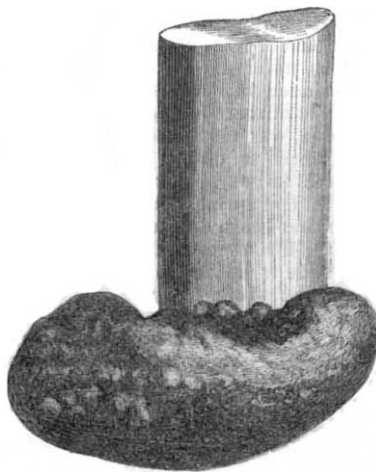
Ealing, September 19

A. A. COMMON

### Contact Makers of Delicate Action

I HAVE allowed an error to creep into the sectional elevation of the contact-maker described in your last issue. The bent wire merely dips into the capsule at D, and is separate from the wire, which passes up the tube. This latter wire merely forms part of the circuit, being connected with the terminal as shown in the plan. It should be noted that the plug K is only inserted when the contact-maker is being moved about. Except when this is the case, the mercury passes freely through the opening at M, and nothing but the friction of mercury resists the motion of the wire.

Some remarks made in the discussion on the paper have led me to carefully examine the end of the platinum wire dipping into the mercury at D. It is shown (highly magnified) in the annexed figure. This end being softened, and no doubt



End of Platinum Wire.

brought to a welding state by the heat, of which the spark is the visible evidence, has, in rapidly beating upon the mercury, been apparently hammered into this shape. The nodules upon it are probably those referred to in books on chemistry as due to the expulsion of occluded hydrogen. The result shown in the figure, produced with a strong current (15 Groves cells) and a small wire, could in practice be easily prevented.

H. S. HELE SHAW

University College, Bristol, September 15

### Bobbers

IN his well-known account of the habits of the Pearly Nautilus, Rumphius (D'Amboinsche Rariteitkamer, door G. E. Rum-